

WHAT IS CLAIMED IS:

1. A storage apparatus comprising:
connection means for connecting to a computer
in which a database management system operates; and
information acquiring means for acquiring
information of data structures including tables,
indexes, and logs defined by schema in said database
management system, and information of recording
positions of data of database in said storage apparatus
that are managed by said database management system and
grouped under each of said data structures defined by
said schema.
2. A storage apparatus according to claim 1,
wherein said connection means is used to connect to
said computer in which a plurality of said database
management systems operate.
3. A storage apparatus according to claim 1,
wherein said connection means is used to connect to a
plurality of said computers in which database manage-
ment system opeates.
4. A storage apparatus according to claim 1,
wherein said information acquiring means acquires
information of said database managed by a plurality of
said database management systems.
5. A storage apparatus according to claim 1,
wherein said information acquiring means acquires said
information by using said connection means.
6. A storage apparatus according to claim 1,

wherein said information acquiring means acquires information of said database that said database management system manages from said database management system.

7. A storage apparatus according to claim 1, wherein said information acquiring means acquires information of said database that said database management system manages through at least one program different from said database management system.

8. A storage apparatus according to claim 1, further comprising:

at least one physical storage device for storing data;

logical-to-physical position conversion means by which logical storage positions used when said computer makes access to said storage apparatus are converted to physical storage positions at which data can be actually stored within said physical storage device;

data allocation changing means for changing said physical storage positions within said at least one physical storage corresponding to said logical storage positions; and

allocation changing plan generation means for generating a plan for changing the physical storage positions of data corresponding to said logical storage positions by using said information acquired by said information acquiring means.

9. A storage apparatus according to claim 8,
further comprising automatic data relocation means for
automatically changing data allocation by use of said
allocation changing means and according to said plan
produced by said allocation changing plan generation
means.

10. A storage apparatus according to claim 8,
wherein said allocation changing plan generation means
decides places to access and the order to access when
said database management system makes access to said
database sequentially on the basis of said information
acquired by said information acquiring means, and makes
data of said sequentially accessed data in database be
placed in continuous regions on said physical storage
device in order that said data can be matched to said
sequential access order.

11. A storage apparatus according to claim 8,
wherein

 said information acquired by said information
 acquiring means further include information of degree
 of parallelism used when said database management
 system makes access to data of said database that
 belong to the same one of said data structures defined
 by said schema, and

 said allocation changing plan generation
 means makes data of said database that belong to the
 same one of said data structures defined by said schema
 be placed on a plurality of said physical storage

devices on the basis of said acquired information.

12. A storage apparatus according to claim 8, wherein said allocation changing plan generation means detects a set of data of said database that are highly likely to be simultaneously accessed, and allocates said set of data on said different physical storage devices on the basis of said acquired information.

13. A storage apparatus according to claim 12, wherein said allocation changing plan generation means extracts table data and index data associated with said table data, and registers said table and index data as a set of said data of said database that are highly likely to be accessed at a time when said index is free-structured index.

14. A storage apparatus according to claim 12, wherein information of said database includes information of history of execution that said database management system has made so far.

15. A storage apparatus according to claim 12, further comprising physical storage device operation information acquiring means for acquiring the operation information of said physical storage devices, wherein said allocation changing plan generation means utilizes said operation information acquired by said physical storage device operation information acquiring means.

16. A storage apparatus according to claim 12, wherein said allocation changing plan generation means registers, log data to be recorded when said database

management system updates data and other data of said database, as a set of said data of said database that are highly likely to be accessed at a time.

17. A storage apparatus according to claim 1, further comprising:

at least one physical storage device for storing data and a cache memory; and

cache memory control means for controlling said cache memory by using said information acquired by said information acquiring means, wherein the information acquired by said information acquiring means further include a method of controlling data of said database that said database management system executes on a host cache that said computer has on its memory, and computer cache data information associated with the amount of data of said host cache.

18. A storage apparatus according to claim 17, wherein said cache memory control means compares said amount of computer cache data that are associated with said data structures defined by said schema and cached on said computer memory, and the size of actual data of said data structures, and decides the priority with which the data stored at storage positions of said actual data of said data structures are cached by using said compared results.

19. A storage apparatus according to claim 17, wherein said cache memory control means compares said amount of computer cache data of said data structures

and the usable amount of said cache memory to data belonging to said data structures in said storage apparatus, and decides the priority with which the data stored at the storage positions of said actual data of said data structures are cached by using said compared results.

20. A method of changing storage positions of data stored within a plurality of physical storage devices by a control unit in a storage apparatus that has connection means for connecting to a computer in which a database management system (DBMS) operates and to administrator's terminals, said plurality of physical storage devices for storing data of said DBMS, said control unit for controlling said storage apparatus and a memory useful for said control unit to control, said method comprising the steps of:

storing in said memory first information of physical storage positions of said data stored in said plurality of physical storage devices;

acquiring second information about the database processing that said DBMS makes through said connection means, and storing said second information in said memory;

generating a plan for making data relocation between said plurality of physical storage devices in order to improve the performance of access to data in said database processing that said DBMS makes on the basis of said first and second information; and

displaying said relocation plan on the display screens of said administrator's terminals through said connection means.

21. A method according to claim 20, further comprising the step of executing said relocation plan in response to an instruction transmitted through said connection means from said administrator's terminals.

22. A method of changing storage positions of data stored within a plurality of physical storage devices by a control unit in a storage apparatus that has connection means for connecting to a computer in which a database management system (DBMS) operates and to administrator's terminals, said plurality of physical storage devices for storing data of said DBMS, a data cache for said data, said control unit for controlling said storage apparatus and a memory useful for said control unit to control, said method comprising the steps of:

storing in said memory first information of physical storage positions of said data stored in said plurality of physical storage devices;

acquiring second information about the database processing that said DBMS makes through said connection means, and storing said second information in said memory;

generating a plan for making data relocation between said plurality of physical storage devices in order to improve the performance of access to data in

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said database processing that said DBMS makes on the basis of said first and second information; and displaying said relocation plan on the display screens of said administrator's terminals through said connection means.